

ABSTRACT OF THE DISCLOSURE

A contact structure incorporating an amorphous titanium nitride barrier layer formed via low-pressure chemical vapor deposition (LPCVD) utilizing tetrakis-dialkylamido-titanium, $\text{Ti}(\text{NMe}_2)_4$, as the precursor. The contact structure is fabricated by etching a contact opening through an dielectric layer down to a diffusion region to which electrical contact is to be made. Titanium metal is deposited over the surface of the wafer so that the exposed surface of the diffusion region is completely covered by a layer of the metal. At least a portion of the titanium metal layer is eventually converted to titanium silicide, thus providing an excellent conductive interface at the surface of the diffusion region. A titanium nitride barrier layer is then deposited using the LPCVD process, coating the walls and floor of the contact opening. Chemical vapor deposition of polycrystalline silicon or of a metal follows.